

## CLAIMS

What is claimed is:

1. A system for actuating a spray pump assembly, the system comprising:
  - a motor component for receiving a power input and a control input and  
5 producing a rotary drive output therefrom;
  - a drive transmission component for receiving the rotary drive output and  
producing a linear drive output therefrom;
  - a spray pump holder component for removably securing the spray pump  
assembly;
  - 10 a force coupler for coupling the linear drive output to the spray pump  
mechanism, so as to apply a force to the spray pump mechanism;
  - a force transducer for producing a force signal proportional to the force  
applied to the spray pump mechanism; and
  - a system controller for receiving a set of test inputs including (i) the force  
15 signal, (ii) one or more feedback signals from the motor component, and (iii)  
user input corresponding to spray pump test parameters, and providing the  
control input to the motor component as a predetermined function of the set of  
test inputs;
  - 20 wherein the system is operative to actuate the spray pump mechanism  
according to an actuation profile defined by the set of test inputs.
2. A method of actuating a spray pump assembly including a reservoir component  
and a pump/nozzle component, via an actuator system including a rotary motor  
driving a linear screw rail assembly, thereby applying a force to the spray pump  
assembly, the method comprising:
  - 25 removably securing the spray pump assembly to a spray pump holder  
component;

determining (i) a quiescent position of the spray pump, and (ii) a fully actuated position of the spray pump assembly;

generating an actuation profile as a predetermined function of the quiescent position, the fully actuated position, and user input corresponding to spray pump test parameters; and

actuating the spray pump according to the actuation profile.

3. A method according to claim 2, wherein determining the quiescent position of the spray pump further includes (i) measuring an amount of force applied to the spray pump assembly, (ii) advancing the linear screw rail assembly until the amount of force applied to the spray pump assembly exceeds a first predetermined value, and (iii) recording a position of the linear screw rail assembly when the amount of force applied to the spray pump assembly exceeds the first predetermined value.

4. A method according to claim 3, wherein determining the fully actuated position of the spray pump assembly further includes (i) continuing to advance the linear screw rail assembly until the amount of force applied to the spray pump assembly exceeds a second predetermined value, and (ii) recording a position of the linear screw rail assembly when the amount of force applied to the spray pump assembly exceeds the second predetermined value.

5. A spray pump holder for securing a spray pump assembly having a reservoir component and a pump/nozzle component, comprising:

(i) a clamp having an aperture disposed about a central axis, and a plurality of fingers disposed about the perimeter of the aperture and extending out from the clamp parallel to the central axis;

(ii) a compression member removably attached to the clamp;

wherein the pump/nozzle component is inserted into the aperture along the central axis, and the compression member, when attached to the clamp, compresses the plurality of fingers against the pump/nozzle component so as to secure the pump/nozzle component to the clamp.

- 5    6.    A spray pump holder according to claim 5, wherein the clamp consists of a low friction material.
7.    A spray pump holder according to claim 6, wherein the low friction material is Teflon.
8.    A spray pump holder according to claim 5, wherein the compression member is  
10    constructed and arranged so as to variably compress the plurality of fingers against the pump/nozzle component.
9.    A spray pump holder according to claim 5, wherein the clamp and the compression member include mating threads, such that the compression member screws into the clamp and drives the fingers toward the central axis.
- 15   10.   A spray pump holder according to claim 5, wherein the compression member consists of anodized aluminum.
11.   A spray pump holder according to claim 5, further including an annular insert disposed about the central axis, between the fingers and the central axis, wherein the pump/nozzle component is inserted through the annular insert and the fingers  
20    compress the annular insert against the pump/nozzle component.

12. A spray pump holder according to claim 5, wherein each of the fingers is characterized by a triangular cross section in a plane perpendicular to the central axis.
- 5 13. A spray pump holder according to claim 5, wherein the clamp is characterized by a substantially square body disposed within a plane perpendicular to the central axis.
14. A spray pump holder according to claim 13, wherein opposite sides of the square body slide into corresponding grooves in a reference platform.
- 10 15. A spray pump holder for securing a spray pump assembly having a reservoir component and a pump/nozzle component, comprising:
  - (i) a bracket for supporting the spray pump assembly, and
  - (ii) at least one securing strap for removably securing the spray pump assembly against the bracket.
- 15 16. A spray pump holder according to claim 15, wherein the bracket includes a first cradle member having a first engaging surface for retaining a first surface of the reservoir component, and a second cradle member having a second engaging surface for retaining a second surface of the reservoir component.
17. A spray pump holder according to claim 16, wherein the first engaging surface is substantially orthogonal to the second engaging surface.
- 20 18. A spray pump holder according to claim 16, wherein the first engaging surface includes a V-shaped surface, so that the first engaging surface contacts a reservoir component having an arcuate exterior surface at two locations.

19. A spray pump holder according to claim 16, wherein the second engaging surface includes a V-shaped surface, so that the second engaging surface contacts a reservoir component having an arcuate exterior surface at two locations.
- 5 20. A spray pump holder according to claim 16, wherein the bracket further includes an aperture, disposed between the first cradle member and the second cradle member, for accommodating a heel portion of the spray pump assembly.
- 10 21. A spray pump holder according to claim 15, further including a first securing strap and a second securing strap, wherein the first securing strap secures the spray pump assembly against the first cradle member, and the second securing strap secures the heel portion of the spray pump assembly into the aperture and against the second cradle member.
- 15 22. A spray pump holder according to claim 15, wherein a first end of the at least one securing strap is fixedly attached to a first anchor on the bracket, and a second end of the at least one securing strap is removably attached to a second anchor on the bracket.
23. A spray pump holder according to claim 22, wherein the second end of the at least one securing strap loops around the second anchor removably attaches to a distal portion of the securing strap.

24. A spray pump holder for securing a spray pump assembly, comprising:
- (i) a base including a body member, and a housing member having a stop tab; and
  - (ii) a clamping assembly including a first lever and a second lever
- 5 pivotally attached at a pivot point about a pivot axle, and a spring attached to the first lever and the second lever so as to force together a first end of the first lever and a first end of the second lever;
- wherein the stop tab provides a platform against which a pump/nozzle component of a spray pump assembly presses, and the pump/nozzle component
- 10 is secured between the first end of the first lever and a first end of the second lever.
25. A spray pump holder according to claim 24, wherein the body member is characterized by a square body, and opposite sides of the square body slide into corresponding grooves in a reference platform.